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Rabies in Minnesota

INTRODUCTION

Ever since the domestication of animals in early times, rabies has been one of the most dreaded diseases transmissible from animals to humans. Although all warm-blooded animals are susceptible to the rabies virus, the disease is maintained in nature by meat-eating mammals and bats.

The rabies virus usually gains entrance into the body via saliva following an animal bite. Bite transmission has accounted for virtually every human and animal case throughout the world; however, airborne transmission also can occur on rare occasions. Once the rabies virus is introduced into the body through the bite wound, it is carried to the central nervous system via the nerve trunks. Once the clinical symptoms of rabies appear, death is almost certain.

RABIES IN ANIMALS IN MINNESOTA

Animal rabies data accumulated by both the Minnesota Livestock Sanitary Board and the Minnesota Department of Health for a 27-year period (1950-1976) revealed 6,075 laboratory-confirmed rabies cases in Minnesota. The average annual number of cases was 225 (ranging from 16 to 443). Minnesota consistently ranked in the top five states in the U.S. for number of animal rabies cases identified. The skunk accounted for 62 percent of the diagnosed cases and is the most important animal species for maintaining rabies in Minnesota. Cattle, dogs, cats, and other species accounted for 18, 6, 5.5, and 8.5 percent, respectively, of the remaining reported animal rabies cases.

RABIES IN HUMANS IN MINNESOTA

Rabies in humans is characterized by a variable incubation period (i.e., length of time from exposure to onset of clinical symptoms), usually between 3 and 8 weeks but varying from 10 days to 1 year. The Minnesota Department of Health reports that from 1907 to 1977, 18 human deaths were attributed to rabies in Minnesota. Sixteen of those deaths occurred prior to 1917, with only one rabies death reported in 1964, and one in 1975. *It should be noted* that the most recent human rabies death was contracted from a *cat* bite. The rabid cat attacked two individuals on two separate occasions. One of the exposed individuals subsequently died.

CLINICAL SIGNS — ANIMALS

The incubation period in animals is quite variable—usually 15 to 50 days, but in rare cases several months. Rabid animals of all species exhibit certain clinical signs which are typical of rabies, with minor variations. Excess salivation, which often becomes frothy in appearance, frequently appears and is the result of the animal's inability to swallow due to paralysis of the muscles used in the swallowing process. This inability to swallow has resulted in the term "hydrophobia" (fear of water) being used to describe the behavior of animals and humans afflicted with rabies.

Animals usually cease eating and drinking and may seek solitude. Eventually, signs of paralysis appear or the animal becomes vicious. Dogs, cats, swine, and occasionally horses and mules attack and bite other animals or people at the slightest provocation. The disease progresses rapidly after the onset of paralysis, with terminal signs of convulsions and coma.

Skunk

In Minnesota, among wild animals, skunks provide the largest single source of rabies exposure to both humans and other animals. Given the absence of a licensed or proven effective rabies vaccine for skunks, coupled with the high endemicity of skunk rabies in Minnesota, they should *not* be considered for pets. Health officials in several states preclude or have placed restrictions on maintaining or selling skunks as pets.

Dogs and Cats

The low number of rabies cases in cats and dogs is a reflection of the generally accepted practice of immunizing pets and controlling stray animals. However, until an effective method of controlling rabies in the wildlife reservoir (skunk, foxes, etc.) is developed, the problem of rabies will continue to remain at its present level.

Considering the almost equal distribution of diagnosed rabies cases in dogs and cats, and the most recent human rabies death, it would appear that both of these companion animals pose a potential risk to the residents of Minnesota. Consequently, a rabies vaccination program should be directed toward both dogs and cats to maximize public health protection against rabies exposure.

Cattle, Swine, and Horses

Although cattle account for the second highest number of diagnosed cases of rabies in Minnesota, swine and horses occasionally may be infected. This primarily is due to their close proximity to skunks and the increased exposure factor. It is neither considered economically feasible, nor is it justified from a public health standpoint to vaccinate all livestock against rabies. However, owners who have valuable animals located in areas where wildlife rabies is endemic are encouraged to have their animals vaccinated annually.

Rodents

The Center for Disease Control, Atlanta, Georgia, reports that rabies is not endemic in rodents and rabbits anywhere in the U.S. Although 25,000 rodents are examined for rabies annually by various laboratories nationwide, only four or five are found to have rabies. There is no evidence that these few confirmed-rabid rodents play any role in the spread of rabies in its major wildlife hosts. Human rabies never has been traced to a rodent or rabbit, despite the fact that at least 24,000 persons are bitten by rodents each year.

The Minnesota Department of Health (MDH) has reported no rabies positives in small rodents or rabbits since 1960. The rare positives reported prior to 1961 actually may have been laboratory false positives. Consequently, MDH discourages sending small rodents (hamsters, gerbils, guinea pigs, chipmunks, squirrels, rats, mice, gophers, voles, moles) or rabbits for rabies testing. In the absence of a human rabies case attributable to exposure to these animals, a bite inflicted by rodents or rabbits rarely, if ever, indicates the need for post-exposure rabies treatment.

CONTROL AND PREVENTION OF RABIES

Control and prevention of rabies in animals and humans focus on five areas:

1. Rabies Vaccination of Dogs and Cats

   Some municipalities in Minnesota have an ordinance requiring compulsory rabies vaccination of both cats and dogs.

   All dogs between the ages of 3 and 6 months should be vaccinated, then revaccinated 1 year later. Adult dogs (1 year or older) vaccinated with modified live virus (MLV)-type vaccines are normally protected against rabies up to 3 years. All cats should be vaccinated annually with a rabies vaccine licensed for use in cats. Cats should be vaccinated initially when they are 3 to 4 months old, and annually thereafter.

   Because of species limitations, techniques, and tolerances, vaccines should be administered under the supervision of a licensed veterinarian. Peak rabies antibody titers are reached within 1 month after vaccination, at which time the animal may be considered protected. An animal should, therefore, be kept on a leash or confined prior to vaccination and for 1 month after vaccination.

2. Control of Stray Animals

   All dogs and cats should be licensed. Stray, unowned, or unlicensed animals should be removed from the community. Special emphasis should be placed on stray animal control in epidemic areas. Local health department or dog control officials can enforce the pickup of strays more efficiently if owned animals are confined in an enclosed area or kept on a leash. Strays should be impounded for at least 3 days to give owners sufficient time to reclaim them.

3. Avoidance of Wild Animals

   Because of the high incidence of rabies in Minnesota wildlife, particularly in skunks, contact with these animals should be avoided whenever possible to reduce rabies exposure potential.

4. Local Wound Treatment

   Immediate and thorough local treatment of all bite wounds and scratches is perhaps the most effective rabies preventive. The wound should be thoroughly cleansed immediately with soap and water. Your physician should be contacted for additional medical care.

5. Pre- and Post-Rabies Exposure Immunization

   The relatively low frequency of severe reactions to rabies duck embryo vaccine (DEV) has made it practical to offer pre-exposure immunization to persons in high risk groups: veterinarians, animal handlers, certain laboratory workers, and persons living in places where rabies is a constant threat.

   Post-exposure prophylaxis for definite, probable, or possible rabies exposure consists of injection of human rabies immune globulin followed by a 23-dose course of DEV.

MANAGEMENT OF THE BITING ANIMAL

Healthy domestic animals (cats or dogs) that *bite* a human should be captured, confined, and observed by a veterinarian for 10 days. If the animal develops signs suggestive of rabies or dies while under observation, the animal should be destroyed by a veterinarian and a properly prepared head specimen shipped in a refrigerated condition (not frozen) to:

Division of Medical Laboratories
Minnesota Department of Health
717 Delaware St., S.E.
Minneapolis, MN 55440

If no human exposure (bite wound) has occurred, the specimen should be forwarded with similar precautions to:

Veterinary Diagnostic Laboratory
College of Veterinary Medicine
University of Minnesota
St. Paul, MN 55108

It should be emphasized that observation of a domestic animal by a veterinarian is the most rapid method of excluding rabies as a diagnosis.

With wild or stray animals, observation is not practical. Such animals should be destroyed immediately with no damage to the head, and the brain examined in the designated laboratory for evidence of rabies.

HEALTH CERTIFICATES

Many states require that domestic pets moving interstate must have a current and valid rabies immunization. Consequently, your veterinarian must ascertain the rabies immunization status of your pet before issuing a health certificate.

Canada requires a certificate from a veterinarian clearly identifying the dog or cat and documenting vaccination against rabies within the preceding 3 years before entrance will be allowed. Seeing-eye dogs and puppies or kittens under 3 months of age are exempt.

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